

1 **CLAIMS**

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3 1. A user interface for displaying hierarchical data, comprising:

4 a first-level display for displaying one or more first-level data items in the

5 hierarchical data;

6 at least one field associated with each first-level data item, each field

7 configured to display a first-level data sub-item associated with the first-level data

8 item or a subordinate data indicator; and

9 wherein the presence of the subordinate data indicator in a field indicates

10 that the field has subordinate data associated with the field, the subordinate data

11 being subordinate to the first-level data items in the hierarchical data.

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13 2. The user interface as recited in claim 1, wherein the subordinate data

14 further comprises one or more second-level data items in the hierarchical data.

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16 3. The user interface as recited in claim 1, wherein the subordinate data

17 indicator is an actuatable icon that, when actuated, displays the subordinate data.

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19 4. The user interface as recited in claim 3, wherein the subordinate

20 data, when displayed, is displayed in a format similar to a format in which the

21 first-level data is displayed.

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23 5. The user interface as recited in claim 3, wherein the subordinate

24 data, when displayed, is displayed so that the first-level data associated with the

25 subordinate data indicator is still visible on the display.

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2 6. The user interface as recited in claim 1, wherein the hierarchical data
3 further comprises extensible markup language (XML) data.
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5 7. The user interface as recited in claim 1, wherein:
6 the first-level display is in a table format having rows and columns;
7 each row represents a first-level data item; and
8 each column represents a field.
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10 8. A graphical user interface, comprising:
11 a first table that displays first-level data items in hierarchical data, the first
12 table having a row for each first-level data item and one or more columns, each
13 column representing a first-level data sub-item associated with the first-level data
14 item of a corresponding row;

15 a second table that displays second-level data items in the hierarchical data,
16 the second table having a row for each second-level data item and one or more
17 columns, each column representing a second-level data sub-item associated with
18 the second-level data item of a corresponding row; and

19 an actuatable first-level subordinate data indicator displayable in a column
20 of a row in the first table that, when actuated, causes at least a portion of the
21 second table to be displayed.
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2 9. The graphical user interface as recited in claim 8, wherein the first-
3 level subordinate data indicator is only displayed when there is subordinate data
4 associated with the first-level data sub-item associated with the row and column in
5 which the first-level subordinate data indicator is displayed.
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7 10. The graphical user interface as recited in claim 8, wherein the row of
8 the first table that contains the actuated subordinate data indicator is visible on the
9 interface when the second table is displayed.
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11 11. The graphical user interface as recited in claim 8, further
12 comprising:

13 a third table that displays third-level data items in the hierarchical data, the
14 third table having a row for each third-level data item and one or more columns,
15 each column representing a third-level data sub-item associated with the third-
16 level data item of a corresponding row; and

17 an actuatable second-level subordinate data indicator displayable in a
18 column of a row in the second table that, when actuated, causes at least a portion
19 of the third table to be displayed.
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21 12. The graphical user interface as recited in claim 11, wherein the row
22 of the second table that contains the second-level subordinate data indicator is
23 visible when the third table is displayed.
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1 13. The graphical user interface as recited in claim 8, wherein the
2 hierarchical data is extensible markup language (XML) data.

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4 14. The graphical user interface as recited in claim 8, wherein the
5 hierarchical data is a database.

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7 15. One or more computer-readable media containing computer-
8 executable instructions that, when executed on a computer, perform the following
9 steps:

10 displaying one or more first-level data items included in a hierarchical data
11 set;

12 displaying at least one field associated with each first-level data item, each
13 field configured to display a first-level data sub-item associated with the first-level
14 data item;

15 displaying a subordinate data indicator in a field if the field in which the
16 subordinate data indicator has subordinate data associated with the field that is
17 subordinate to the first-level data items in the hierarchical data.

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19 16. The one or more computer-readable media as recited in claim 15,
20 wherein the hierarchical data set is an extensible markup language (XML) data set.

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22 17. The one or more computer-readable media as recited in claim 15,
23 wherein the subordinate data indicator is actuatable and computer-executable
24 instructions further display the subordinate data when the subordinate data
25 indicator is actuated.

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2 18. The one or more computer-readable media as recited in claim 17,
3 wherein the data item associated with the subordinate data indicator and the fields
4 associated with the data item are visible when the subordinate data is displayed.
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6 19. The one or more computer-readable media as recited in claim 15,
7 further comprising:

8 displaying a table having rows and columns;
9 wherein the first-level data items are each displayed in a row of the table;
10 and

11 wherein the first-level sub-items are each displayed in a column of the
12 table, the column in which a first-level sub-item is displayed being associated with
13 a row that is associated with a first-level data item that corresponds to the first-
14 level sub-item.
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16 20. The one or more computer-readable media as recited in claim 15,
17 wherein the subordinate data further comprises one or more second-level data
18 items in the hierarchical data.
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20 21. The one or more computer-readable media as recited in claim 20,
21 wherein:

22 the first-level data items, the first-level data sub-items and the data
23 indicator are displayed in a first format; and

24 the subordinate data is displayed in the first format.
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the first-level data items, the first-level data sub-items and the data indicator are displayed in a first format; and

the subordinate data is displayed in a second format.

23. One or more computer-readable media containing computer-executable instructions that, when executed on a computer, perform the following steps:

displaying a first table that shows one or more first-level data items included in a hierarchical data set, the first table having a row corresponding to each first-level data item and one or more columns that each correspond to a first-level data sub-item associated with the first-level data item of a corresponding row;

displaying at least a portion of a second table that shows one or more second-level data items in the hierarchical data set, the second table having a row corresponding to each second-level data item and one or more columns that each correspond to a second-level data sub-item associated with the second-level data item of a corresponding row;

displaying one or more actuatable subordinate data icons, each in a column of a row in the first table that, when actuated, causes at least a portion of the second table to be displayed; and

wherein the actuatable subordinate data icon is only displayed if there is second-level data that corresponds with the first-level data sub-item associated with the column in which the actuatable subordinate data icon is displayed.

24. The one or more computer-readable media as recited in claim 23, wherein a row in the first table that contains the actuated subordinate data icon remains visible after the second table is displayed.

25. The one or more computer-readable media as recited in claim 23, further comprising computer-executable instructions that, when executed on a computer, perform the following steps:

displaying at least a portion of a third table that shows one or more third-level data items in the hierarchical data set, the third table having a row corresponding to each third-level data item and one or more columns that each correspond to a third-level data sub-item associated with the third-level data item of a corresponding row;

displaying one or more actuatable subordinate data icons in the second table, each in a column of a row in the second table that, when actuated, causes at least a portion of the third table to be displayed; and

wherein the actuatable subordinate data icon is only displayed in the second table if there is third-level data that corresponds with the second-level data sub-item associated with the column in which the actuatable subordinate data icon is displayed.

26. The one or more computer-readable media as recited in claim 25, wherein a row in the second table that contains the actuated subordinate data icon remains visible after the third table is displayed.

27. A method for displaying hierarchical data in hypertext markup language (HTML), comprising:

- traversing the hierarchical data;
- building a visual representation for each level of the hierarchical data in HTML;
- storing the visual representations;
- displaying the visual representation for at least a first level of the hierarchical data; and
- displaying an actuatable subordinate data indicator that, when actuated, displays a second level of the hierarchical data, the second level of the hierarchical data being subordinate to the first level of the hierarchical data.

28. The method as recited in claim 27, wherein the at least a first level of the hierarchical data further comprises a top level of the hierarchical data.

29. The method as recited in claim 27, wherein the traversing the hierarchical data further comprises traversing the hierarchical data in a depth-first manner.

30. The method as recited in claim 27, wherein the visual displays are built for all of the hierarchical data before any of the displays are displayed.

1 31. The method as recited in claim 27, further comprising:
2 displaying the visual representation for at least a second level of the
3 hierarchical data; and
4 displaying a second-level actuatable subordinate data indicator that, when
5 actuated, displays a third level of the hierarchical data, the third level of the
6 hierarchical data being subordinate to the second level of the hierarchical data.

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8 32. The method as recited in claim 27, wherein the hierarchical data is
9 extensible markup language (XML) data.

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11 33. A method for displaying hierarchical data in hypertext markup
12 language (HTML) comprising:
13 building a first-level display for a first level of data in the hierarchical data,
14 the first-level display having one or more actuatable subordinate data indicators
15 that are displayed for each data item that has second-level data associated with it;
16 displaying the first-level display;
17 when a subordinate data indicator is actuated, building a second-level
18 display for the second level of data in the hierarchical data that is associated with
19 the data item corresponding to the subordinate data indicator that has been
20 actuated; and
21 displaying the second-level display.

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23 34. The method as recited in claim 33, wherein the hierarchical data is
24 extensible markup language (XML) data.

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1 35. The method as recited in claim 33, further comprising:
2 including a second-level subordinate data indicator in the second-level
3 display for each data item that has third-level data associated with it;
4 when a second-level subordinate data indicator is actuated, building a third-
5 level display for the third level of data in the hierarchical data that is associated
6 with the data item corresponding to the second-level subordinate data indicator
7 that has been actuated; and
8 displaying the third-level display.

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10 36. The method as recited in claim 33, wherein the hierarchical data
11 further comprises a database.

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13 37. The method as recited in claim 33, further comprising:
14 determining if the second-level display has been previously created; and
15 creating the second-level display only if the second-level display has not
16 previously been created.

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18 38. The method as recited in claim 37, wherein the determining if the
19 second-level display has been previously created further comprises referencing a
20 data path that indicates whether the second-level display has been previously
21 created.

39. The method as recited in claim 37, wherein the determining if the second-level display has been previously created further comprises referencing a data path that indicates whether the second-level display has previously been created, and wherein the method further comprises appending information to the data path when the second-level display is created if the second-level display has not previously been created, the information indicating that the second-level display has been created.

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